

5.0 Study Organization

The study is envisioned to be completed through study management as described in Section 5.1, along with additional working groups. The overarching groups described in Section 5.2 are integral portions of the study which provide resources and support to all. The technical study groups described in Section 5.3 will complete all the detailed hydraulic and hydrological work necessary for the Lake Superior outflow regulation and St. Clair River studies. The data generated by these two groups will then be used by the Resource Groups described in Section 5.4. The resource groups will use the water levels, flows, and other hydraulic and hydrological information to determine impacts on their particular resource area. These impacts will show how the various resource groups respond to the alternative regulation plans.

5.1 Study Management

Given the multi-disciplinary nature of the study, it is proposed that a Study Board be set-up to direct the work of the study teams. The Study Board would be responsible for the conduct of the study; the Board would ensure that study objectives are met, that work is focused on meeting study objectives, that schedules are maintained, and that funds are allocated in a timely and logical manner. The Board would be composed of an equal number of members from Canada and the United States who would be appointed by the IJC to serve in their personal and professional capacities. The POS team recommends that the Study Board consist of 6 to 10 people, as a Study Board that is too large can become unwieldy, which reduces effectiveness. The Board members should be experts in the fields related to this study with the experience and ability to understand and take an objective approach to scientific/technical information.

LESSON LEARNED: A smaller and more engaged study board is desirable.

The IJC should consider the appointment of study director(s) to provide leadership to the study and to chair the study board, and study manager(s) to manage day-to-day financial and administrative operations of the study. The addition of administrative assistant(s) may also help in the process, depending on the time commitments of any director(s) and manager(s). Clear objectives for these positions would need to be established at the outset to ensure the leadership of the study is clear and duplication of effort is not occurring.

The Study Board would then establish specific binational committees as needed. They would be responsible for conducting the individual studies for their particular resource area. They would be composed of an equal (as nearly as possible) number of members from Canada and the United States who would serve the Commission in their personal and professional capacities. Potential agencies that have the necessary expertise for these individual studies are listed in Annex 3.

LESSON LEARNED: The study board needs to be careful to ensure that team members are not advising the board to fund work tasks that benefit their specific agency and personal research project.

Prior to the conduct of the study and expenditure of funds, the roles and responsibilities of the Board, the study director(s), study manager(s) and all committees would be clearly defined. It is expected that, like the International Lake Ontario – St. Lawrence River Study, the IJC would seek government funding for the study. The funding obtained by the IJC would be used to help fund Board operations - for example travel, communication, and contract work. Government agencies in Canada and the United States may provide some in-kind support of their expert staff.

LESSON LEARNED: Terms of Reference for the Study Board, Study Directors and other groups need to explicitly outline their respective roles, responsibilities and expectations.

LESSON LEARNED: There are increasing pressures from within agencies to limit in-kind support to various projects. The study should budget for and pay for most services. Increased start-up time is required to bring additional staff and resources to bear on the study.

The IJC should take care to ensure that First Nations / Native American peoples are considered for membership throughout the study. They should have representation in the appropriate areas, such as the Study Board, the Public Interest Advisory Group, the technical study groups and the resource evaluation groups. Members should be considered to reflect the geographic diversity as well as interests such as ecosystems, water use, coastal processes, navigation, hydropower, recreational boating and tourism, riparians and any others as appropriate.

The Study Board will take on the charge to ensure adaptive management is considered throughout the conduct of the study. A recent review of adaptive management policies for the U.S. Army Corps of Engineers noted the following elements that the Study Board may wish to consider:

- Management objectives that are regularly revisited and accordingly revised.
- A model(s) of the system being managed.
- A range of management choices.
- Monitoring and evaluation of outcomes.
- A mechanism(s) for incorporating learning into future decisions.
- A collaborative structure for stakeholder participation and learning.

Many of these items are already designed into this POS. The Study Board should then ensure the other aspects are addressed consistently across the study and make any overarching recommendations on adaptive management in their report to the IJC.

All committees will be expected to communicate routinely with each other and to share efforts (for instance GIS data, hydrological scenarios, climate forecasts, etc). Since the

end result is to balance and optimize the benefits to all resources, good coordination and cooperation between the study committees is critical. The IJC appointed study director(s)/study manager(s) will ensure cooperation and communication among the study committees and seek efficiency where resources can be shared.

It is proposed that the Study Board would meet a minimum of twice a year, or more often as required. The purpose of the meetings may vary, but important objectives would be to evaluate progress and provide additional direction to the committees. Each of the committees would meet more frequently and provide quarterly status reports to the Study Director(s)/Manager(s), who, in turn, would provide updates and status reports to the Study Board. Progress reports would be provided to the IJC on a semi-annual basis. The Study Director(s)/Manager(s) would also be available to brief the IJC at their semi-annual hearings in Washington and Ottawa.

The costs for study management for the study include salaries and travel. Costs are also included for administrative support of the study by the IJC each year as there are many additional tasks required in conducting a study of this magnitude. Costs are estimated as follows:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Total Cost (U.S. dollars)	\$440K	\$440K	\$440K	\$440K	\$440K
or					
Total Cost (Canadian dollars)	\$528K	\$528K	\$528K	\$528K	\$528K

The total cost for study management of the study would be about \$2,200K (U.S. dollars). This is equivalent to about \$2,640K in Canadian dollars.

5.2 Overarching Groups

There are several groups necessary for this study which are essential to provide critical support to the study. They will have broad involvement and impact on the study as a whole. They are required to ensure a successful completion of the study and are noted below.

5.2.1 Communications Group

Ongoing communications during the execution of the study are extremely important. A separate group would be established for handling all the communication efforts, both within the study itself, as well as externally. Communications would be accomplished through a variety of means, including public meetings, workshops, conference presentations, newsletters, email, and the Internet.

The POS revision team utilized an IJC web page during development of the POS to provide information to interested parties regarding the POS development. Once the study is initiated, a detailed study web page needs to be created to provide a means of ongoing public communication. The web page could contain, at a minimum:

- Objectives/Goals of Study
- Study Board members and Director(s)/Manager(s)
- Working Group members
- Descriptions on ongoing studies
- Searchable metadata system, describing distributed data that reside on users' systems
- Periodic updates on study progress
- Individual committee reports on methods and results
- Any graphics or PowerPoint presentations developed to help explain study objectives/goals
- An area that allows public to provide feedback and to add their name to a mailing list for notification of public meetings and events
- Basic educational information on Great Lakes hydraulics and hydrology and the limited influence of Lake Superior regulation.

Another communication tool would be a study newsletter that would be sent to all interested members of the public on a semi-annual basis. The newsletter would serve to update the public on studies underway, any results available, and other current events related to the study. The newsletter would be sent to members of the public, agencies, and groups that participated in the POS consultation as well as names added to the mailing list through the web page. This newsletter would also go to media outlets with news releases highlighting any interesting developments. In addition, conference calls could be used to communicate study progress to interests around the basin.

LESSONS LEARNED: The Lake Ontario Study web site was a success in that it got more than a million hits. However, improvements are possible to provide the information designed to meet the needs of the readers. The newsletter, Ripple Effects, was excellent, and a similar product should be considered when conducting the Upper Lakes Study.

LESSON LEARNED: It may be advantageous to have a seasoned, dedicated communications person leading this aspect on a part-time basis, possibly one of the officers of the IJC.

Public meetings would be planned on an annual basis to communicate with the public in a more formal manner. The meetings could be coordinated to coincide with the International Lake Superior Board of Control's annual meetings or other related events. In addition to mailouts and internet notices, the team should also use newspapers and radio to publicize public meetings. Presentations for regional conferences are another good means of communicating the study goals and early results with the technical community.

LESSON LEARNED: The turn out at some public meetings have been very low for the Lake Ontario Study, even though they were held in large cities. Additional effort is needed to advertise events.

An issue of public involvement that would be addressed during the study is recommendations for ensuring appropriate communication with interested parties following completion of the study. Many interested parties could benefit from easier access to water levels and flow data. The Communications Group would tackle this issue, ensuring that a wide range of communication enhancements are investigated and recommendations are made on the most feasible options.

It is recommended that the Communications Group also address the issues of public education. K-12 educational materials may be appropriate as well. Issues to be included would be lake level variability, climate change, human-induced changes and others. Educational opportunities may help to ensure the success of the study by educating people on the natural system and how little influence man really has.

The costs for a Communications Group for the study, including salaries and travel, are estimated as follows:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Total Cost (U.S. dollars)	\$75K	\$100K	\$75K	\$100K	\$100K
or					
Total Cost (Canadian dollars)	\$90K	\$120K	\$90K	\$120K	\$120K

The total cost for Communications for the study would be about \$450K (U.S. dollars). This is equivalent to about \$540K in Canadian dollars.

5.2.2 Public Interest Advisory Group

A Public Interest Advisory Group (PIAG) is a critical element in reviewing the regulation of outflows and potentially recommending improved criteria and regulation plans. This group differs from the Communications Group discussed above in that the PIAG would act as more of an avenue for public input to the study, rather than study presentations to the public. It is critical that the public involvement process begin early and continue throughout the study. The PIAG should be established at the study initiation and should meet twice a year, as a minimum. PIAG members will be appointed by the IJC. A size of 10-12 members is recommended. It should be noted that PIAG members are volunteers, with only their travel paid. The expectations of time commitments should be clearly communicated to potential members at the start of the study.

In addition to obtaining views and opinions from the public, it is equally important that the public and interested parties are informed on the limitations of regulation of Lake Superior outflows and its effects on downstream levels and flows. The public information program must convey the understanding of the relationship of natural vs. anthropogenic effects on water levels and flows.

To achieve this understanding, it is recommended that the major user groups and a select number of the public be involved directly in the study. The PIAG should be an advisory arm of the Study Board. The POS team recommends that the PIAG be assembled to ensure that the interests and issues of major affected groups and parties are represented in a formal way during the study. The PIAG would have members that

would act as liaisons to each of the committees, and thereby have significant knowledge of the direction of the study and the work of the various committees. Given its unique role, PIAG would be a forum for evaluating and ground-truthing the direction of the study. Through the PIAG, the public would help meet the goals and objectives of the study, provide input to the development of evaluation methodologies, identify possible regulation scenarios and remediation options, and provide advice and guidance to other critical components of the study.

The PIAG would include members representing a variety of interests, with representatives chosen through their affiliation. These could include riparians, commercial navigation, hydropower, recreational boating and tourism, ecosystems, fisheries, municipal and industrial water users, and others as appropriate. The PIAG would include representatives from Canada and the U.S., from Lake Superior down through Lake Erie.

Members of the PIAG are expected to assist with other public involvement efforts using their own local contacts. For example, a representative of a shoreline property owners group that participates on the PIAG would be expected to keep its members up to date on the activities and efforts of the PIAG and the study itself. This would help facilitate communication to all interested parties and the general public. The team recognizes that many resources and interests are keenly concerned about variations in water levels and flows. Many of these interests have competing recommendations for water level changes. The success of the study would be dependent in part on conveying the complex issues regarding competing uses of the waters to the public and furthering the understanding that most proposed solutions that benefit one resource would have some negative consequences for others.

The costs for a Public Interest Advisory Group for the study are estimated as follows:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Total Cost (U.S. dollars)	\$50K	\$100K	\$100K	\$100K	\$100K
or					
Total Cost (Canadian dollars)	\$60K	\$120K	\$120K	\$120K	\$120K

The total cost for Public Interest Advisory Group of the study would be about \$450K (U.S. dollars). This is equivalent to about \$540K in Canadian dollars.

LESSON LEARNED: A public interest advisory group is essential.

5.2.3 Information Technology

The Team recommends the development of an Information Management Strategy (IMS) for the study. This should be developed early in the process so that all study groups are following consistent guidelines related to information collected and generated by the study. The IMS should include an assessment of available information resources, likely future additional resources and alternative approaches for integrated information management. A distributed approach toward information management is recommended, rather than central repositories of information.

A web site should be used for public information exchange while an FTP site might be better suited for the exchange of more detailed information between the study groups. The Information Technology Group would be tasked with running the FTP site and ensuring that information posted to the site is properly documented, follows standardized naming conventions, and that only recent versions of files remain on the site. Appropriate security measures should be in place to ensure only approved people can add, delete or modify files.

The Information Technology Group should also work toward early identification of model integration and data exchange standards. This will help with seamless integration of several models during the evaluation phase. A protocol could be quite simple, such as flat file exchange of data as long as basic standards are set early on.

All study data should include the production of compliant metadata. Metadata are records about the quality, lineage, appropriate uses and other characteristics of the information compiled for, or used by, the study. The Information Technology Group should ensure metadata templates are produced early in the study and distributed to all working groups for use.

The Information Technology Group also needs to address management of all study web sites, FTP sites, document management systems, etc. This is important, not only throughout the life of the study, but into the future as well.

The costs for the Information Technology implementation in the study, including salaries and travel, are estimated as follows:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Total Cost (U.S. dollars)	\$50K	\$50K	\$50K	\$50K	\$50K
or					
Total Cost (Canadian dollars)	\$60K	\$60K	\$60K	\$60K	\$60K

The total cost for Information Technology would be about \$250K (U.S. dollars). This is equivalent to about \$300K in Canadian dollars.

5.2.4 Independent Technical Review Group

An important lesson learned from the International Lake Ontario – St. Lawrence River Study was that independent technical review is a critical part of ensuring study success. This was noted by several of the individual task groups. It is recommended that a process to ensure independent technical review be instituted at the beginning of the study. Two options for independent technical review are possible. The first being a single group, comprised of diverse members, who would handle the technical review for all aspects of the study. The second being an oversight group who would ensure the individual groups conducted their own appropriate independent technical reviews.

In the first case, the Independent Technical Review Group could involve members with backgrounds in economics, hydraulics and hydrology, ecosystems, coastal processes,

hydropower, commercial navigation, recreational boating and tourism, water use, plan formulation and plan evaluation. Members should be selected from both the U.S. and Canada, though not necessarily needing one for each category from both countries, in an effort to keep the group a manageable size. These members should not have participated in the development of the Plan of Study or be members of any of the Working Groups associated with the execution of the study, so as to avoid any potential or real conflicts of interest that could arise regarding review of work. This group would review the working group products as they are generated to be sure they meet accepted scientific standards and support the study goals. Having one consolidated Independent Technical Review Group could help to ensure studies are coordinated among the working groups and that each group's work is complimentary with the others.

In the second case, the Independent Technical Review Group would consist of one member from each country with a background in the concept of independent technical review. They would be responsible to coordinate this process for the whole study for consistency and credibility, and advise the committees on whether certain work should be reviewed through the external arms-length mechanism. Each group would then be responsible for conducting necessary independent technical review of their technical products and reports, as appropriate. The group would be responsible for liaising with independent bodies contracted by the IJC to oversee the independent peer review process, such as the Royal Society of Canada and the National Academy of Sciences. This would ensure the independent technical reviews are being accomplished in a coordinated fashion, but would place the work tasks within each technical study group, overarching group and resource evaluation group.

LESSON LEARNED: The studies and their assumptions should be reviewed by organizations such as the National Academy of Sciences.

The costs for Independent Technical Review of the study, including salaries and travel, are estimated as follows:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Total Cost (U.S. dollars)	\$0K	\$25K	\$100K	\$100K	\$25K
or					
Total Cost (Canadian dollars)	\$0K	\$30K	\$120K	\$120K	\$30K

The total cost for Independent Technical Review would be about \$250K (U.S. dollars). This is equivalent to about \$300K in Canadian dollars.

5.2.5 Plan Evaluation Group

A sound evaluation methodology identified early in the process and used to guide decisions on study design is critical to the success of the overall study. The evaluation methodology would be used to characterize and assess impacts associated with various water level and flow scenarios. The methodology must be able to measure effects on non-economic resources such as ecosystems so that evaluations can consider effects on all resources. The committee may consider developing a set of performance indicators to assist in evaluating effects of alternative regulation plans on each of the

resource areas. The indicators should address for each resource, common parameters associated with Lake Superior outflow regulation and remediation options put forward regarding the St. Clair River. Such parameters could include timing of water level/flow changes, annual and seasonal level and flow averages and variations, recovery potential, and adaptability of the resource to various temporal scales of water level fluctuations. Trade-offs must be made, considering basin-wide and cumulative effects on hydropower, navigation, recreational boating and tourism, ecosystems, and water use. Trade-offs and balancing even within one resource area must be considered when evaluating regulation changes on such a large geographic area. Using the parameters suggested above, the study team could determine which short-term impacts may be reasonably acceptable if they occurred at a certain time or if the affected resource could adapt to the changes, thus minimizing impacts.

The evaluation methodology is so critical that the POS team recommends that an evaluation committee be established at the outset of the project. The evaluation committee would include, as a minimum, one member from each of the resource committees. Another option would be to select members based on their experience with Great Lakes modelling and evaluation processes. Each of these members could then be assigned to a particular resource group throughout the study to act as a liaison between the resource group and the evaluation group. In addition, the chairs of the evaluation committee should have access to expertise in decision support technology, which would be very helpful in establishing the methodology for making regulation decisions and recommendations regarding remediation options. The evaluation committee would be formed at the start of the study and would define its evaluation methods, as well as the data and informational needs at the outset of the study, which would help focus the work of the individual resource committees.

LESSON LEARNED: Be aware that there are uncertainties when evaluating small changes among the regulation plans.

The costs for the evaluation methodology committee for the study, including salaries and travel, are estimated as follows:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Total Cost (U.S. dollars)	\$100K	\$200K	\$150K	\$150K	\$200K
or					
Total Cost (Canadian dollars)	\$120K	\$240K	\$180K	\$180K	\$240K

The total cost for the evaluation methodology in the study would be about \$800K (U.S. dollars). This is equivalent to about \$960K in Canadian dollars.

5.3 Technical Study Groups

It is anticipated that one of the first actions of the Study Board would be to establish specific technical work groups that would be responsible for study design using the scope, methods, and tasks discussed previously. The technical work groups would use

the available expertise of the two nations and allocate resources accordingly, utilizing the various agencies with potential participation of the groups listed in Annex 3. Scheduling of their work would need to be coordinated through the Study Board.

A technical study group would be required for the work tasks related to the St. Clair River portions of the directive. These tasks and costs are described in Chapter 2. A second technical study group would be required for the work tasks related to the evaluation of Lake Superior's regulation plan, which may also reflect remediation options, and would include all associated hydrological and hydraulic studies as noted in Chapter 3. Advances made regarding system modelling (e.g., modelling environment, rating curves, etc.) would be incorporated into the efforts associated with the evaluation of Lake Superior's regulation plan and criteria. The tasks and costs are described in Chapter 3.

Through the evaluation and study process, it is likely that a number of trial regulation plans would need to be developed and considered by the Study Board to allow the effects of any new or revised criteria or other regulation plan changes to be described in a manner that the general public and the IJC can fully appreciate. While criteria may be stated in a number of ways, including upper and lower limits of levels or flows or restrictions on the frequency of exceeding certain conditions, their impacts and impacts of regulation plan improvements can only be appreciated once they are used to frame a new regulation plan. The outcome can then be tested using historical data so as to allow comparisons against previous experience.

5.4 Resource Evaluation Groups

The Study Board would also establish specific resource evaluation groups that would be responsible for study design using the scope, methods, and tasks previously discussed. The resource evaluation groups would also use the available expertise of the two nations and allocate resources accordingly, using the various agencies with potential participation of the groups listed in Annex 3. Development and schedules of their work would need to be coordinated through the Study Board.

Resource evaluation groups would be necessary for the following interests: ecosystems, recreational boating and tourism, hydropower, commercial navigation, municipal, industrial and domestic water use, and coastal zone. The tasks and costs are described fully in Chapter 4.

It would be the task of the overall Study Board, with input from each technical study group and resource evaluation group, as well as the Public Interest Advisory Group, to then consider the recommendations from the resource evaluation groups and bring these forward for public discussion of the impacts and benefits of various regulation plans and criteria. The Board, with assistance from the various study groups, should also assess how the current Orders, or any recommended changes to them, are carried out.

It is important that all interested parties understand that the study is not expected to be simply one of adding one or two regulation criteria. Since the needs of the users are different and divergent, conflicts among the criteria will invariably surface. As well, there is the potential that remediation measures for the St. Clair River may further complicate the review of and potential improvements to the regulation plan and criteria. As noted earlier, the challenge of the study will be to promote understanding and acceptance of what is feasible given current institutional arrangements and control facilities. The process leading to new criteria and/or improvements to the regulation plan would include iterations in defining possible changes, meeting with user groups, and meetings with the IJC, which may itself result in consultations with governments.

5.5 Schedule and Cost

The proposed study for the review of regulation of outflows from Lake Superior and the investigation into the potential regime change of the St. Clair River has been designed to obtain the optimal amount of benefit versus cost. The study would be conducted such that the information deemed necessary to make decisions on alternative regulation plans would be available at the conclusion of the study. It would require 5 years to complete, assuming a 6-month organizational spin up time, approximately 4 years of technical studies, and a 6-month period for study summation and public presentation. The study would be conducted by, and these funds allocated to, a series of binational teams. The teams would be composed of subject matter specialists serving in their personal and professional capacities from various federal, state and provincial agencies; academia and private consultants; and the stakeholders impacted by Lake Superior regulation and St. Clair River issues. The binational Study Board would conduct overall coordination and provide leadership necessary to bring the study to a successful conclusion.

The study is estimated to cost a total of \$14.6 million in U.S. dollars, which is equivalent to \$17.5 million in Canadian dollars. This represents the total cost of the study; it is assumed that the cost would be split roughly equally between the two Governments. A cost summary, based on the five-year implementation period is presented in Tables 4 and 5. Costs in Canadian dollars were estimated as 1.2 times U.S. dollar costs.

Table 4. Total Cost Summary (Thousand U.S. dollars)

Study Components	YR1	YR2	YR3	YR4	YR5	Total
St. Clair River	500	1,250	1,250	500	0	3,500
Lake Superior Regulation	350	650	650	530	200	2,380
Ecosystem	200	550	550	350	100	1,750
Recreational Boating and Tourism	50	125	125	100	50	450
Hydropower	20	100	100	20	20	260
Commercial Navigation	20	100	100	20	20	260
Municipal, Industrial, and Domestic Uses	50	150	150	100	50	500
Coastal Zone	200	300	300	200	100	1,100
Study Management	440	440	440	440	440	2,200
Communication	75	100	75	100	100	450
Public Interest Advisory Group	50	100	100	100	100	450
Information Technology	50	50	50	50	50	250
Independent Technical Review	0	25	100	100	25	250
Plan Evaluation	100	200	150	150	200	800
Grand Total	2,105	4,140	4,140	2,760	1,455	14,600

Table 5. Total Cost Summary (Thousand Canadian dollars)

Study Components	YR1	YR2	YR3	YR4	YR5	Total
St. Clair River	600	1,500	1,500	600	0	4,200
Lake Superior Regulation	420	780	780	636	240	2,856
Ecosystem	240	660	660	420	120	2,100
Recreational Boating and Tourism	60	150	150	120	60	540
Hydropower	24	120	120	24	24	312
Commercial Navigation	24	120	120	24	24	312
Municipal, Industrial, and Domestic Uses	60	180	180	120	60	600
Coastal Zone	240	360	360	240	120	1,320
Study Management	528	528	528	528	528	2,640
Communication	90	120	90	120	120	540
Public Interest Advisory Group	60	120	120	120	120	540
Information Technology	60	60	60	60	60	300
Independent Technical Review	0	30	120	120	30	300
Plan Evaluation	120	240	180	180	240	960
Grand Total	2,526	4,968	4,968	3,312	1,746	17,520